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BDM PROJECT

To Increase the Sale and Reduce the Manufacturing Cost of a Firm of Bricks Industry

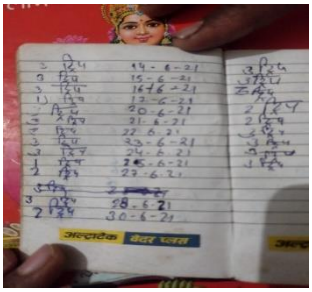
- **Executive Summary**:

  This is the second document in line with the BDM capstone project. In this project, we have identified two problems of Ramdev Bricks Manufacturers which are to increase the sale and reduce the manufacturing cost of bricks. For this purpose, primary data has been collected with the help of owners. The proof of this process has been given in the section "**Primary Data Collection Procedure**". The data was put on MS Excel worksheets to start our analysis process. As it was raw data, so first it was cleaned to make it ready for further analysis. After cleaning the data, descriptive analysis was done on the data whose full description is given in the section "**Descriptive Statistics**". To find the trends and relationships, a graphical analysis was done that helped us find clues and causes of the given problems. Then these findings and results were shown to stakeholders to cross-check our interpretations. After validating our interpretations, I will start working on finding recommendations for these problems with the help of books, the internet and owners. Then these solutions will be presented to the stakeholders. The whole process is explained in the section "**Explanation of Analysis Process".**

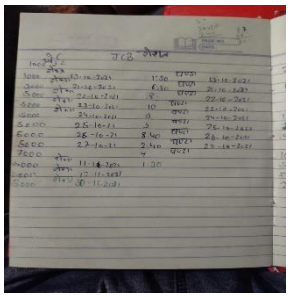
- **Primary Data Collection Procedure:**

  The data has been collected with help of owners. As it's a small business so they don't store data electronically. They use the old method: keep data in a diary, notebooks etc. And few of the data were collected from the market itself. I am in constant touch with the owners to understand data correctly. The proof of originality is given below in form of photos, videos of the meeting with the owner and a letter from the organization.

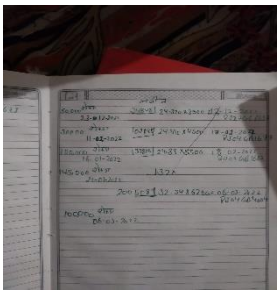
- Photos:



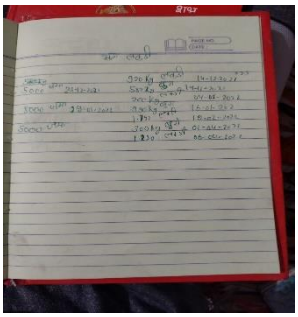
Clay Data



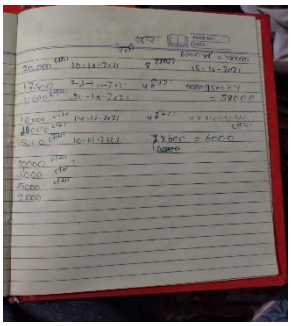
Digging Data



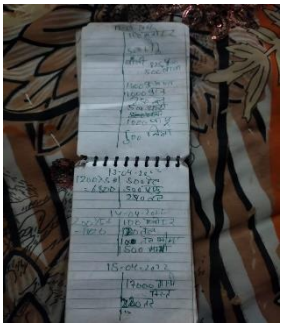
Coal's Data



Wood Data

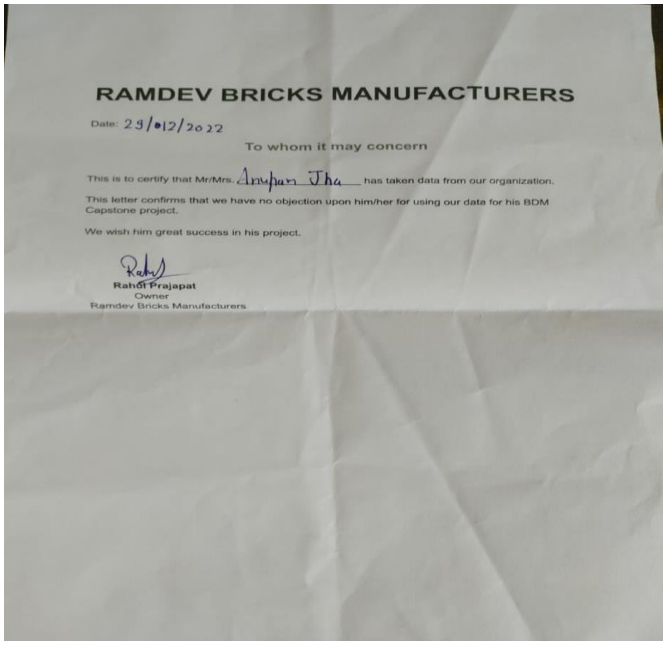


Rally Data



Sales Data

- Letter from the organization:



RAMDEV BRICKS MANUFACTURERS

Date: 29/12/2022

To whom it may concern

This is to certify that Mr/Mrs. Arnjan Jha has taken data from our organization.

This letter confirms that we have no objection upon him/her for using our data for his BDM Capstone project.

We wish him great success in his project.

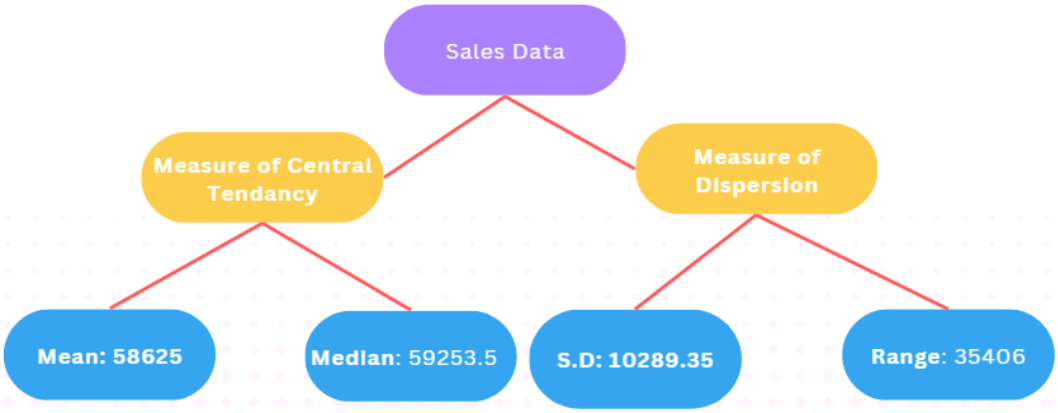
Rahul Prajapat
Owner
Ramdev Bricks Manufacturers

- Video Link: https://drive.google.com/file/d/1pmzJ3hlgraLujEMRol27KrV_a0xdhH-I/view?usp=share_link

♦ **Descriptive Statistics**:

- **Sales Data**:

  The daily sales data from 1 Dec. 2021 to 30 Nov. 2022 has been collected. And then the data was cumulated on monthly basis. The descriptive statistics of the data are as follows:



  - Total sales from Nov.21 to Dec.22: 7,03,500 bricks
  - The mean of data points is 58625 bricks.
  - The median of data is 59253.5 bricks.
  - The standard deviation of the data is 10289.35 bricks.
  - The maximum number of sales happened in the month of Jan. 2022 which is 75455 bricks.
  - The minimum number of sales happened in the month of Nov. 2022 which is 40049 bricks.
  - The 1st and 3rd quartiles are 55207.5 bricks and 63706.5 bricks respectively.

- **Manufacturing Data:**
  - **Rally's Data:**
    There were 2 kinds of the rally were bought because of the different uses of respective rallies.
    - 9 dumpers and 4 tractors (i.e., around 275 tonnes) were bought of 1st kind which is cheaper that is costed ₹58400.
    - 4 dumpers (120 tonnes) were bought of 2nd kind which is costlier and that is costed ₹38000.

  - **Wood's Data**:
    To produce heat wood is required and its descriptive statistics are given below:
    - The wood was bought in 6 phases (i.e., on 6 different dates). And the total quantity was 5420 Kg.
    - The incurred cost was ₹18970.00

  - **Digging Data**:
    - The no. of hours of digging happened: 69 hours(approx.)
    - Cost of digging: ₹1000/hour

- The total cost of digging: ₹68,833.33

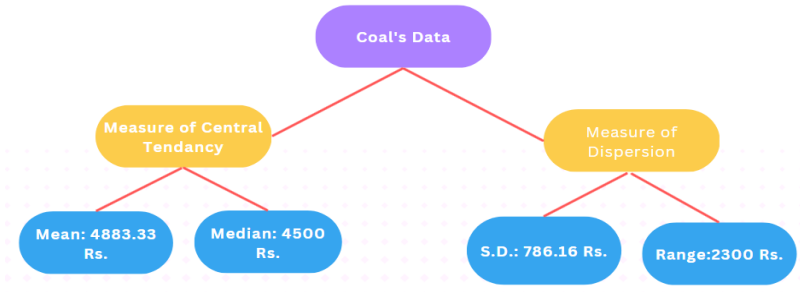
- **Clay's Data**:
  - There were three vendors from whom the clay was purchased.
    1. Vendor1:
       Total No. of trips: 148(888 tonnes.)
       Cost per trip: ₹1100/trip
       Total cost: ₹1,62,800

    2. Vendor2:
       Total No. of trips: 158(948 tonnes.)
       Cost per trip: ₹675/trip
       Total cost: ₹1,06,650

    3. Vendor3:
       Total No. of trips: 79(474 tonnes.)
       Cost per trip: ₹650/trip
       Total cost: ₹51,350

- **Coal's Data**:
  The coal is used to produce heat which is given to bricks after making. And transportation cost of coal consists of two costs: 1. Price of coal 2. Transportation cost. And descriptive statistics of coal are as follows:

  1. Data without including transportation cost:



  - The mean of data points is ₹4883.33/tonne.
  - The median of data is ₹4500.00/tonne.
  - The standard deviation of data is ₹786.16/tonne.
  - The maximum price of coal was ₹6200/tonne on 06 Mar. 22.
  - The minimum price of coal was ₹3900/tonne on 12 Dec. 22.
  - The 1st and 3rd quartiles of data are ₹4350/tonne and ₹5250/tonne.

  2. Transportation Cost:
     There were 4 different vendors from whom the coal was bought and their transport cost varies as follow:
     Vendor1: ₹1300/tonne
     Vendor2: ₹1300/tonne

Vendor3: ₹1400/tonne
Vendor4: ₹1280/tonne

- The total quantity of coal was bought: 182.82 tonnes.
- The total cost of coal including Transportation cost: ₹11,31,738.40

- **Other Cost**:
  1. Labour wage:
     Making cost: ₹0.75/brick
     Total making cost: ₹5,27,625
     Wage to put bricks on kiln: ₹0.43/brick
     The total wage for putting bricks on the kiln: ₹3,01,500
     Total wage: ₹8,29,125

  2. Electricity used to extract water:
     The volume of water extracted: 7,03,500 L
     Total units of electricity used: 895.79 units
     Cost of electricity: ₹7.1/unit
     Total electricity cost: ₹6360.11

  3. Cleaning expense: ₹30,000

  4. Transport Cost (For loading bricks from the making area to the kiln area):
     i) Driver's salary: 1,20,000/annum
     ii) Diesel's expense:
     Price for loading one brick: ₹0.02
     Total cost: ₹14,070

  5. Bricks Loading Cost:
     Cost for loading: 0.10/brick
     Total Cost: ₹70,350

  6. Land Lease Cost: ₹40,000

- **Explanation of Analysis Process**:
  - **Book-keeping to Excel**:
    The data were in books and diaries. So, to analyse our data the first step was to make it electronic. So all the data were put on excel worksheets.

  - **Cleaning of Data**:
    After getting the required data. It needed to be cleaned for further analysis. For that purpose, MS Excel was used. The missing values were replaced with the average value of the data set in sales data.

  - **Getting Descriptive Statistics**:

To know about the data set we needed to find metadata and descriptive statistics to get a starting point to understand the problems of business, their impact on business, the causes of the problems, their possible solution and the overall impact of that solution on business. To get descriptive statistics about our data set we used MS Excel. The descriptive statistics of the data set are given above in the section "**Descriptive Statistics**".

- **Interpretation and Finding Causes of the Problems**:
  After knowing the descriptive statistics about the data set, now I tried to interpret the data, find some trends, and find relationships among different data to get to the root of the problems with the help of different tools available in MS Excel like: graph representation etc. And some of the findings are given in the section "Findings and Results".

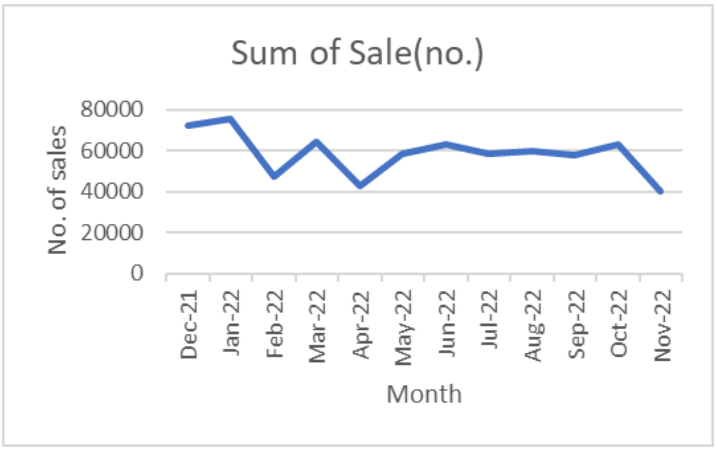
- **Showing Results to Stakeholders**:
  After the interpretation of the data set, I showed the findings, trends and causes of the problems to stakeholders to get more information on these results and cross-checked our findings keeping the perspective of the brick industry.

- **Finding Solutions**: After getting into our data set, and knowing the causes of the problems then I will start to find the recommended solution to problems with the help of the internet, books, and talking with industry experts and stakeholders. And I will also analyse the impact of that solutions on the business and whether it will be a feasible solution or not, their positive aspects as well as negative aspects.

- **Showing Solution to Stakeholder**: Then I will plan a meeting with the owners of the firm to show the solutions, what factors we have considered and the impact of these solutions on their overall business.

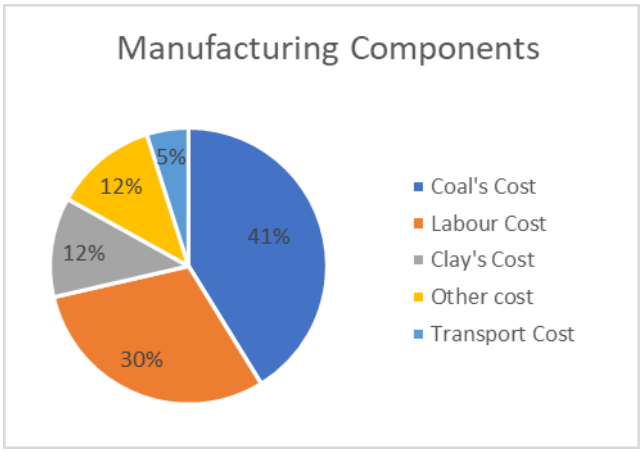
♦ **Findings and Results**:
Below are some of the findings and results after analysing our data set:

1. Sales Data:



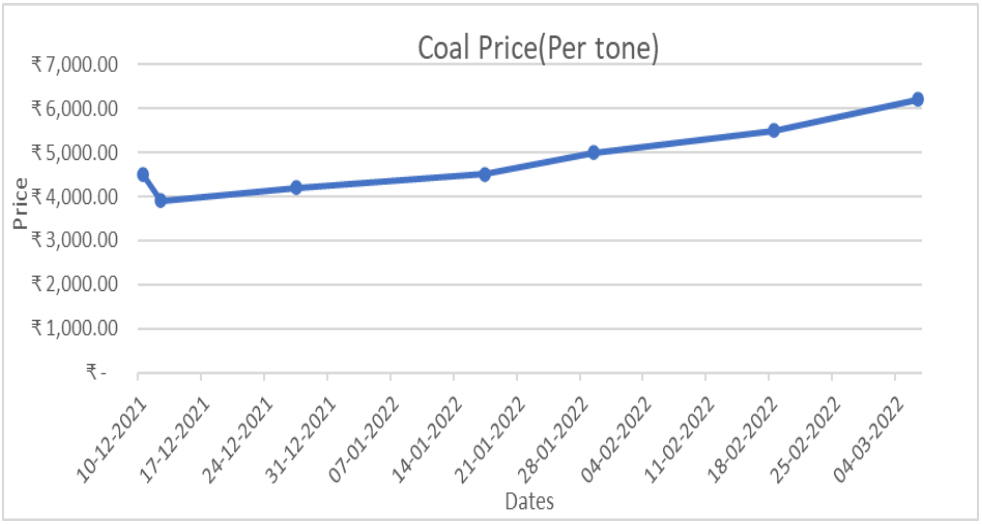
- There is no apparent trend in the graph.
- However, we can see that from June-22 to Sep-22 there is a constant sale.
- And from Dec-21 to May-22 there is much fluctuation in the sale.
- Then there is a rise from Sep-22 to Oct-22 but then a sudden drop in Nov-22.
- The minimum sale was in the month of Nov 22 and the maximum sale was in the month of Jan 22.

2. Manufacturing Cost Data:



- In this pie chart, we can see all the components of manufacturing costs.
- Coal cost takes 41% part of the total cost which is huge.
- The labour cost take 30% part of the total cost. That means around 71% of total manufacturing cost incurred due to two things: Coal and Labour.
- The clay and transportation cost is 12% and 5% respectively.
- The other cost, which is constituted of Rally, Wood, Electricity, Cleaning, Loading, Land Lease, and Digging Cost, is 11%.

3. **Coal Data**:



- In this graph, we see an upward trend.
- The price of coals was being constantly rising from Dec.21 to Mar.22 except for one drop from 10 Dec. 21 to 12 Dec.21.
- The minimum price of coal was on 12 Dec.21 and the maximum price of coal was on 06 Mar. 22.